

What is claimed is:

1. A cooling tower for introducing cooling air into and extracting heated air from an extruded thermoplastic thin wall tubular bubble, said tower adapted to be mounted forward of an extrusion die for producing said bubble, said tower comprising in combination:

a tower structure having an outer wall, an upstream end, a downstream end, and a longitudinal axis, said tower further having a first internal central channel extending from said downstream end for receiving said cooling air, said outer wall having at least one output port communicating with said central channel and said bubble for distributing cooling air within said bubble; said tower further having a second central channel surrounding and isolated from said first channel, said second channel extending from said upstream end for receiving said hot air, said outer wall having at least one input port communicating with said second channel and said bubble for withdrawing heated air from said bubble.

2. The tower of claim one wherein said tower has a plurality of output ports and said output ports are distributed about the periphery of said wall in spaced apart relationship along said longitudinal axis.
3. The tower of claim two wherein said output ports constitute annular slits.
4. The tower of claim one wherein said tower has a plurality of input ports, said tower further includes a cap affixed to said downstream end of said tower, and said input ports are disposed in said cap.
5. Internal bubble cooling apparatus for extruded thermoplastic thin wall tubular bubbles comprising in combination:

A. an annular die head having an inner axially disposed chamber, said die head connectable to an extruder for continuously extruding a tubular bubble of thin wall thermoplastic material;

B. a first pipe coaxially disposed within said die head chamber having an input end for receiving a supply of cooling air and an output end for communicating with the interior of said bubble; and

C. a second pipe coaxially disposed within said die head chamber surrounding said first pipe, said second pipe having an input end for communicating with the interior of said bubble and an output end for withdrawing heated air from said bubble.

6. The internal bubble cooling apparatus of claim 5 further including a cooling tower attached to said die head adapted to reside within said bubble, said tower connected to said first and second pipes, said tower having at least one output port for transferring cooling air to said bubble and at least one input port for withdrawing heated air from said bubble.
7. The method of cooling an extruded thermoplastic thin wall tubular bubble comprising the steps of:
 - A. providing an annular die head for receiving extruded thermoplastic material at one end and producing said bubble at the opposite end;
 - B. providing a first inner channel within said die adjacent the inner wall of said die;
 - C. providing a second inner channel within said first channel separated from said die inner wall by said first channel, both of said channels arranged to communicate with the interior of said bubble;
 - D. providing a source of cooling air under pressure to said second channel; and
 - E. withdrawing air heated within said bubble by heat exchange with said bubble through said first channel whereby said bubble is cooled by cooling air introduced into said bubble through said second channel and heated air is evacuated from said bubble through said first channel.
8. The method of claim 7 further including the step of providing a cooling tower forward of said die and within said bubble to uniformly distribute said cooling air within said bubble and to uniformly withdraw said heated air from said bubble.